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NC Task Force on Fish Kill Waters and EPA Present Findings of Pfiesteria Study

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Raleigh, NC.....Dr. Kenneth Hudnell, a neurotoxicologist at the US Environmental Protection Agency's National Health and Environmental Effects Research Laboratory in Research Triangle Park, NC, has found preliminary evidence that contact with water where *Pfiesteria* is thought to be killing or sickening fish may adversely affect a person's ability to detect visual patterns. *Pfiesteria piscicida* is a toxin-producing marine organism that has been associated with fish kills in estuaries and adverse human-health effects.

This visual assessment was part of a larger medical study conducted last November under the guidance of the NC Task Force on Fish Kill Waters. The task force, composed of scientists and medical doctors from Duke University, East Carolina University, University of North Carolina at Chapel Hill and the National Institute of Environmental Health Sciences, is providing guidance on dealing with *Pfiesteria* to the Department of Health and Human Services. The remainder of the study's findings--which included neuropsychological screenings--was reported in June and did not find an association between exposure and chronic health effects.

Hudnell assisted the state by evaluating the vision of two groups of fishermen in North Carolina -- one working in estuaries where *Pfiesteria*-related fish kills had occurred previously and another fishing in waters where exposure was unlikely. The investigators did not know which group of fishermen worked in *Pfiesteria*-inhabited estuaries.

Hudnell administered a visual contrast-sensitivity test to both groups of fishermen. This test measures the amount of contrast needed between dark and light bars for a person to see a pattern. The results indicate that the exposed fishermen's ability to detect the visual patterns was reduced by about 30 percent. Visual acuity (the ability to focus on objects) was also evaluated, but no adverse effects were found in either group of fishermen. This evidence suggests that the Pfiesteria toxin(s) may affect the neurological processes that play a role in regulating the visual system.

No differences in variables other than time spent in the estuaries, including age, education, medical history, alcohol consumption, smoking or occupational exposure to neurotoxins, were found which might account for the group difference in ability to see visual patterns. Significant deficits in contrast sensitivity (detecting patterns) may cause individuals to perform
tasks more slowly and may increase the risk of accidents.

The EPA data on North Carolina fishermen is the first to suggest that exposure to estuarine water where *Pfiesteria*-related fish kills are occuring may affect vision. Additionally, since the fishermen had not been exposed to fish kills recently, this is the first suggestion of a persistent health effect from contact with *Pfiesteria* toxin(s). Previous studies in Maryland found that environmental exposure *to Pfiesteria piscicida* or similar organisms may cause temporary learning or short-term memory loss, confusion and other cognitive impairments in humans.

EPA officials stress that the study is preliminary. It reveals a possible correlation between exposure to estuaries where *Pfiesteria* has been found and effects on vision, but it does not prove a causal relationship. "Further research is needed before definitive conclusions can be made as to whether *Pfiesteria* may adversely effect vision or pose other human-health risks, " Hudnell said. If the preliminary findings are supported, researchers believe the visual contrast-sensitivity test shows promise as a sensitive screening tool for detecting effects of toxins from *Pfiesteria* or other similar organisms.

Based on these findings, the task force continues to recommend that the public avoid recreational or commercial activities in fish kill waters. "These findings are very preliminary and we don't know if the problems are caused by *Pfiesteria* or something else found in the estuary," said Dr. Bill Roper, dean of UNC's School of Public Health and task force chairman. "There is still a great deal of research to be done. North Carolina, the Environmental Protection Agency, the Centers for Disease Control and other states are working to answer the outstanding questions. In the meantime, citizens need to avoid dead, dying and sick fish to minimize their exposure to any potential problems."

The NC Department of Health and Human Services is participating in a regional study with the Centers for Disease Control to look at possible associations between human health effects and *Pfiesteria*. North Carolina, in parallel with Maryland and Virginia, will track 100 individuals who have been exposed to *Pfiesteria* along with 100 control subjects who have not been exposed. That study will be conducted in 1999, with findings released sometime in 2000. EPA's visual contrast-sensitivity test as well as neuropsychological tests like those used by Maryland researchers will be included in the test battery administered to the subjects.

North Carolina has stepped up its efforts to deal with *Pfiesteria* and related problems. Last spring, Governor Jim Hunt created the Harmful Algal Blooms program which monitors potential health effects of *Pfiesteria* and other potentially harmful organisms. The state has created a toll-free hotline for citizens to report potential problems and get information on those problems. The state has also posted warning signs along the Lower Neuse, advising people to avoid dead, dying and sick fish.

North Carolina's Department of Environment and Natural Resources is attacking the water quality problems which are thought to cause *Pfiesteria* outbreaks and other potentially harmful algal blooms. DENR has created a 30 percent nitrogen-reduction plan for the troubled Neuse River and rapid response teams for the Neuse and Tar-Pamlico rivers to investigate fish kills and gather up-to-date data on water quality conditions. The agency has stepped up fines for water polluters and strengthened its enforcement program. DENR recently received $365,000 in
federal funds for increased monitoring for *Pfiesteria*, systematic fish collection and sampling, and fish health evaluations. The state is also seeking $221 million from the federal Conservation Reserve Enhancement Program to help Tar Heel farmers control nutrient run-off from farm lands.

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